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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,989	04/05/2001	Jed W. Fahey	046585/0138	4463

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EXAMINER

DELACROIX MUIRHEI, CYBILLE

ART UNIT PAPER NUMBER

1614

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/825,989

Applicant(s)

FAHEY ET AL.

Examiner

Cybille Delacroix-Muirheid

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 48-63 and 65-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 48-63 and 65-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Detailed Action

The following is responsive to applicant's amendment received April 19, 2005.

Claims 1-47 and 64 are cancelled. Claims 48-63, 65-71 are currently pending.

The previous claim rejection under 35 USC 112, second paragraph, set forth in paragraph 1 of the office action mailed Jan. 27, 2005 is withdrawn in view of applicant's amendment and the remarks contained therein.

However, upon reconsideration of the pending claims with the examiner's supervisor, the following new ground(s) of rejection is respectfully submitted.

The allowability of claims 48-57 are withdrawn in view of the following new ground(s) of rejection based on newly discovered prior art.

New Ground(s) of Rejection

Claim Rejection(s)—35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 48-50, 51-57 rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al., 4,158,656 (already of record) in view of WO 97/07230 ('230).

Jones et al. disclose a method for extracting glucosinolates, the method comprising contacting seed material (rapeseed) with an aqueous-lower alkanol (water-alcohol, i.e. ethanol) solvent solution at a temperature below 600 °C and under conditions so as to prevent enzymatic degradation of the glucosinolates. Jones et al. additionally disclose that the temperature is kept below 600 °C in order to prevent activation of the myrosinase. Please see claim 1; col. 1, lines 3- 6; col. 4, lines 44-63.

Jones et al. do not teach extracting glucosinolates using a mixture of dimethyl sulfoxide, acetonitrile and dimethylformamide. Yet, the examiner turns to WO '230, which discloses a solvent extraction method comprising extracting polyhydroxy-alkanoates from biomass using a mixture of solvents, such as acetonitrile, dimethylformamide and dimethylsulfoxide (please see the abstract; page 6, first ¶ under

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Solvent Extraction). The biomass comprises plants, which include agricultural crops such as rapeseed. Please see page 5, Biomass, lines 1-17.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the extraction method of Jones et al. by substituting the aqueous lower-alkanol solvent with the solvent mixture dimethyl sulfoxide, acetonitrile and dimethylformamide as suggested by WO '230 because WO '230 teach that the use of such solvents results in an environmentally friendly and economical process for recovering products from a large-scale biological source (please see page 3, lines 5-7). Such a modification would have been motivated by the reasonable expectation that ???

Concerning claim 49, since successful extraction of glucosinolates is related to the concentration of solvents present, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the prior art extraction method such that the acetonitrile, dimethyl sulfoxide and dimethylformamide are present in an amount to optimize the extraction process.

With respect to claims 50-51, since Jones et al. specify that the temperature of the extraction process remain below 60⁰ C in order to prevent activation of the myrosinase enzyme, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the prior art method such that the extraction process is performed at a temperature which allows for effective isolation of glucosinolates while avoiding unwanted activation of myrosinase enzymes.

Finally, claims 53-57 are taught by WO '230, which discloses treatment of numerous plants from agricultural crops. In addressing the claimed homogenization of

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the plant tissue, this is also taught by WO '230, which defines "solvent" as a substance which dissolves another substance to form a uniformly dispersed mixture (solution).

2. Claims 58, 59, 60, 62, 63, 65-67, 68-70, 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al., 4,158,656 in view of Pusateri et al., 5,882,646 and Cho et al., WO 9419948 (all references already of record).

Jones et al. disclose a method for extracting glucosinolates, the method comprising contacting seed material (rapeseed) with an aqueous-lower alkanol (water-alcohol, i.e. ethanol) solvent solution at a temperature below 600⁰ C and under conditions so as to prevent enzymatic degradation of the glucosinolates. Jones et al. additionally disclose that the temperature is kept below 600⁰ C in order to prevent activation of the myrosinase. Please see claim 1; col. 1, lines 3- 6; col. 4, lines 44-63.

Jones et al. do not disclose that the isolated glucosinolates are added to food; however the Examiner refers to (1) Pusateri et al., which disclose that brassica vegetables contain glucosinolates, which are helpful in fighting disease. Pusateri et al. additionally disclose that glucosinolates are converted to isothiocyanates, which are known chemoprotective agents. Please see col. 1, lines 12-24; and (2) Cho et al., which discloses that isothiocyanates such as sulforaphane, isolated from Brassica, are known to detoxify carcinogens. Cho et al. additionally disclose a food product, which contains the sulforaphane. Please see claim 25; the abstract; pages 6-7.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Jones et al. by adding the isolated glucosinolates to food products because, in view of the prior art, especially Cho et al., one of ordinary skill

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in the art would reasonably expect that foods supplemented with such chemoprotective agents would serve to reduce the risk of cancer in humans. Furthermore, since the isolation process of Jones inactivates enzymes, such as myrosinase, one of ordinary skill in the art would reasonably expect the glucosinolates to remain intact (i.e. not split into harmful substances). Therefore, such a modification would have been motivated by the reasonable expectation of producing a food product conferred with healthy anticancer properties.

With respect to the claimed food products (claims 68-69), it would have been obvious and well within the capability of the skilled artisan to determine the desired, conventional food products within which to incorporate the glucosinolates. In addressing the claimed homogenization of plant tissue with solvent, homogenization is an art-recognized result-effective variable and it would have been obvious to one of ordinary skill in the art to modify it in the method of the prior art.

Finally, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Jones' extraction method to other sources of plant or seed material with the reasonable expectation that the disclosed method would effectively isolate and extract the desired glucosinolate compounds.

3. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones in view of Pusateri and Cho as applied to claims 58-60, 62-63, 65-71 above, and further in view of Passey et al., 5,290,578.

Jones, Pusateri and Cho as applied above.

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However, these references do not disclose an extraction method using carbon dioxide as the solvent. Yet, the examiner refers to Passey et al., which disclose that supercritical fluid extraction using CO₂ has been previously used to extract oil from oilseeds such as soybeans or rapeseed. Passey et al. additionally disclose that CO₂ is neutral from the point of view of taste, inert and easy to remove after extraction. Please see col. 1, lines 64 to col. 2, line 18.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Jones by substituting the aqueous-lower alkanol solvent solution with CO₂ because one of ordinary skill in the art would reasonably expect CO₂ to effectively extract and isolate glucosinolates from the rapeseed. Furthermore, such a modification would have been motivated by the reasonable expectation of performing an extraction process using a solvent, i.e. CO₂, which is effective, inert and easy to remove after extraction of the glucosinolates.

Conclusion

Claims 48-60, 61, 62-63, 65-71 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Cybill Delacroix-Muirheid** whose telephone number is **571-272-0572**. The examiner can normally be reached on Mon-Thurs. from 8:30 to 6:00 as well as every other Friday from 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Christopher Low**, can be reached on **571-272-0951**. The fax phone


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number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CDM 

July 11, 2005


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